Remarks

In the Office Action dated July 12, 2004, the Examiner rejected claims 1-3, 5-6 and 24 under 35 U.S.C. § 102 as being anticipated by the U.S. Patent to Pai, et al. 6,429,034. The Examiner rejected claims 1-3, 5-6 and 24 under 35 U.S.C. § 102 as being anticipated by the U.S. Patent to Tsang 5,620,931. The Examiner rejected claims 4, 7 and 23 under 35 U.S.C. § 103 as being unpatentable over Pai, et al. and further in view of the U.S. Patent to Eden, et al. 6,347,237.

Briefly, as noted on line 29, page 2 through line 17 on page 3, while the capacitive gap between vertical micromechanical structures (i.e., defined by the thickness of a sacrificial layer) can be very small, there are limitations in the resulting structures. The present invention provides for increased electromechanical coupling between a lateral micromechanical structure and an electrode by providing a process to form a lateral submicron gap between the electrode and the micromechanical structure (such as a resonator) without the need for advance lithography tools.

Independent claim 1 has been amended to make it clear that the substrate is surface micromachined to form a capacitively-driven, lateral micromechanical structure. A first capacitive transducer electrode is also formed on the substrate. A sacrificial spacer layer is removed to form a first lateral submicron capacitive gap between the micromechanical structure and the first capacitive transducer electrode to increase electromechanical coupling therebetween.

None of the prior art of record taken either alone or in combination with one another disclose these features. For example, the U.S. Patent to Pai, et al. 6,429,034 discloses a method for making high aspect ratio features during surface micromachining. However Pai, et al. fails to disclose the formation of a capacitively-driven, lateral micromechanical structure or a first capacitive transducer electrode wherein a spacer layer between the two structures is

removed to form a first lateral submicron capacitive gap to increase electromechanical coupling therebetween.

The U.S. Patent to Tsang, et al. discloses a monolithic capacitive type microstructure. However, Tsang, et al. also fails to disclose the formation of a capacitively-driven, lateral micromechanical structure and a first capacitive transducer electrode wherein a spacer layer therebetween is removed to form a first lateral submicron capacitive gap therebetween to increase electromechanical coupling.

The U.S. Patent to Eden, et al. discloses a pair of fixed plates separated from a floating plate by a variable vacuum gap wherein a mechanical driver varies the gap between the fixed and floating capacitor plates. Eden, et al. also fails to disclose the formation of a capacitively-driven, lateral micromechanical structure and a first capacitive transducer electrode separated from the structure by a spacer layer which is removed to form a first lateral submicron capacitive gap therebetween to increase electromechanical coupling.

Consequently, in view of the above and in the absence of better art Applicants' Attorney respectfully submits the application is in condition for allowance which allowance is respectfully requested.

Respectfully submitted,

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